

ASD Highlights for the Week Ending June 17, 2005

Ring Systems Installation activities included:

- The HEBT Collimator remote clamps were leak teste and adjustments are being implemented.
- The HEBT Collimators' pneumatic control lines are being installed.
- The HEBT beamline cross-over Bridge was assembled and positioned for mounting.
- The HEBT laser stripping assembly facility infrastructure modifications were completed.
- The HEBT laser stripping assembly mounting feet were installed and support frame inserted for clearance verification.
- The HEBT shield wall construction was started.
- The HEBT shield wall fire door frame was installed.
- The HEBT shield wall HVAC fire damper was installed.
- The RING Injection Chicane Magnet Chambers # 2 & 3 were installed.
- The RING Injection Foil Changer was installed.
- The RTBT 21Q40 magnets QV24 and QH22 were installed.
- The RTBT the vacuum Ion Pump Support stands were sent out for assembly.
- The RTBT / Target Duratek shield block relocation was determined.

Water Systems Installation activities included:

- Installation of the HEBT Momentum Dump Closed Loop Cooling System was started.
- Modification of the HEBT Linac Dump cooling header to accommodate the Laser Stripping System was completed.
- Installation of the Ring Collimators' (3) remote cooling connections was completed.
- Installation of the RTBT 21Q40 magnets' cooling connections continued.
- Modification of the RFTF Klystron cooling system to accommodate the new Thales 2.5 MW klystron continued.
- Preventative Maintenance on the Linac water systems continued.

Survey & Alignment

- DTL, CCL:
No activity.
- SCL:
The realignment of the Laser transfer line and beam boxes was completed.
Five SCL dummy pipes realigned.
- HEBT:
QH30 rough aligned
16 laser stripper bolt holes set out
The survey control network in the downstream half of the HEBT was re-observed. Data quality checks and adjustment are nearly complete.
- LINAC DUMP LINE
The initial layout and positioning of Laser stripping magnet complete.
Fiducialization of Russian magnets scheduled for next week.
- RING:
8 CSS bolt holes set out
12 half cells leveled
1 quarter cell leveled
Initial Foil alignment and check out in progress.
- As part of the recent HEBT re-observation campaign, some survey ties were made into the Ring to ensure datum consistency between the two parts of the network. However, some of the elevations within the Ring were found to be internally inconsistent. This was surprising, since the Ring network had been re-observed only three months previously (March 2005). A quick, but precise, differential leveling campaign revealed that a portion of the Ring (north side of A-arc, at

the beginning of the injection area) had settled by 1 mm. This area is not underlain by any known construction-induced dropout.

- RTBT:
Calculations for the placement of the Lambertson Magnet underway.

TARGET:
Shine shield octagon mapped
One BL2 guide rail set for elevation
BL4 tall forms located with respect to beam line
Set one pedestal for BL4 beam stop
30 BL2 guides mapped in place on rails
BL4 beam stop placement
BL4 pedestal re-set

Magnet Measurement:
21Q40_47 fiducialized
21Q40_40 optically aligned
21Q40_40 fiducialized
21Q40_56 optically aligned
21Q40_59 (QH22) coupled with corrector DCH41

Networks:
Tie ends of HEBT network with the total station
Level through the intersection of the HEBT and Ring networks

- Target
The survey network on the south Target floor was extended to incorporate experimental lines 3, 4, and 5. Quality checks revealed that one laser tracker setup was inconsistent with the rest of the network – that setup was repeated, and the latter results were good. Further data quality checks and adjustment are nearly complete.

Magnet Measurement:

- We installed two 21Q40 assemblies in the RTBT.
- We have picked four more 21Q's for the RTBT.
- We are assembling the Magnets onto the LEDP.

Electrical Systems Group

- Completed integrated magnet and power supply testing for SCL power supply SCL_MAG:PS_QH32a33.
- Completed all Main Ring Power Supply tunnel cabling. This completes all Ring arc magnet cabling.

SCL

- Conditioned, calibrated and tested the cavities in CM 22. That cryomodule was originally production series number 2, and it was designated for electropolishing. Three out of four cavities were electropolished. The maximum fields at 4.2 K before quench in open loop are 22.0, 17.8, 9.6 and 15.5 MV/m. Cavity C has the lowest quench field of any cavity in the linac.
- Auto tune was implemented on all the tunable cavities (69).
- Loops were closed on 69 of the 77 cavities available and the limiting fields of all the cavities evaluated at 4.2 K. The average value of the maximum fields in closed and open loop differ by

1%, indicating that the additional thermal and field emission loading over the full flat pulse is not critical

- All available cavities were turned on (76 out of 77) and the fields held at 80% of the maximum value for extended periods of time (hours). The heat load on the cryogenics system is consistent with the RF losses being the main contributing factor. At 80-90% of the maximum field it should be possible to sustain a repetition rate of at least 30 pulses per second at 4.2 K.
- With 75 out of 77 cavities running, a final energy well above 900 MeV and possibly close to 1 GeV can be reached with the installed cavities.
- Noise, cross talk, stability of the LLRF system are being addressed on a cavity by cavity basis and will be the focus of the work in the next several days.

HEBT, Ring, and RTBT commissioning, for week ending 17/Jun/05

- A diamond stripper foil, fabricated by ORNL, has been installed in the Proton Storage Ring at LANL for testing. This will provide the most realistic test possible for this new type of stripper foil that we plan to use at SNS. The dimensions of the PSR stripper foil are close to those for the SNS foil, so this also demonstrates that we can fabricate diamond stripper foils, with three free sides, for SNS with the required dimensions.
- Modifications to the ORBIT ring simulation code are now in progress to allow tracking of the H⁺, H⁰, and H⁻ particles created by the ring injection process. This new capability is necessary to design the 1.3 GeV ring injection system.

ASD Operations:

- Supporting SCL and Warm Linac Testing
- Revising the SAD
- Preparing for the ASRC meeting
- Working on Radiation Shielding Calculations, Materials and plans for Operating scenario in the Klystron Building. RSC meeting today.
- Preparing for DOE
- Preparing for the ARR.
- Working with the Cryo group on CHL Procedures.
- Interviewing Chief Operator – 27th, Offer out on Co-Op Student at Tennessee Tech for an Operator/Trainee